SPECIAL NEW BUILDING ISSUE

THE Cane Growers' QUARTERLY BULLETIN

VOL. XXII, No. 3. 1 JANUARY, 1959

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BUREAU OF SUGAR EXPERIMENT STATIONS
BRISBANE

THE CANE GROWERS' QUARTERLY BULLETIN

ISSUED BY DIRECTION OF THE
SUGAR EXPERIMENT STATIONS
BOARD

1 JANUARY, 1959

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This Bulletin is an official publication of the extension service of the Bureau of Sugar Experiment Stations, issued and forwarded by the Bureau to all cane growers in Queensland.

The Cane Growers' Quarterly Bulletin

VOL. XXII. JANUARY 1, 1959 No. 3

EDITORIAL

The Bureau's New Building

During the month just passed the Bureau realised a long-standing ambition: it took over occupation of its own headquarters building in Brisbane. Since the creation of the Bureau in 1900 *as the official research organization of the sugar industry its administrative centre has been successively in Bundaberg—for nine years under Dr. Maxwell —and in the Department of Agriculture and Stock building in Brisbane.*

Both the steady growth of the Bureau, and its divorcement from the Public Service in 1951, *made it necessary and desirable that it move to more commodious quarters specifically designed and equipped for its expanding operations.*

Although planned only in 1957 *the completed administrative building was finished in time for an opening by the Hon. the Premier (Mr. G. F. R. Nicklin) on December 4th,* 1958, *and the Brisbane staff of the Bureau is now installed in its own premises. It thus becomes the first of the various sugar organizations to have its own administrative building in the capital city.*

The new building, situated on the heights of Gregory Terrace, is worthy of the great industry which has entrusted the Bureau with the responsibility of its scientific research. It is not proposed that the Bureau's activities will be concentrated in the capital city—rather the reverse. During recent years its policy of decentralisation has resulted in a number of its research personnel being transferred to sugar towns to establish closer contact with the problems under investigation. This policy will continue.

Overproduction of Sugar*

By NORMAN J. KING

The sugar industry in Queensland is faced this year with an over-production problem for the first time in this generation. Maybe producers in other fields of primary industry would consider that any farming community should feel very satisfied with such a degree of stability, and may wonder why so much dissatisfaction exists regarding a single year of oversupply.

Admittedly the sugar industry is very stable, and its production and marketing arrangements well organized, but nevertheless the position which exists this year developed so suddenly that it came as a shock to both growers and millers in the affected areas.

It is not generally known to the Australian public that sugar cane is grown only on a permit system. A grower must possess what is called an assignment to produce cane, and that assignment relates to a specific acreage. He cannot grow more than the permitted acreage nor can he transfer that acreage to another portion of his property. A new grower cannot just take up land and plant cane unless he has previously obtained the necessary permit. This is the form of acreage restriction which contributes to the stability of the industry and which prevents production forging ahead of markets.

The sugar industry's markets are fixed just as rigidly. Firstly the Australian consumer must be supplied with all requirements before any sugar is exported and the surplus goes to fill an export quota which is part and parcel of the International Sugar Agreement; this quota cannot be exceeded except in particular cases which I will refer to later.

The production control which is in existence limits each of the 31 sugar mills in Queensland to the manufacture of a given tonnage or raw sugar and this figure limits, in turn, the amount of sugar cane which each farmer can supply to the mill. The aggregate of the mill figures is known as the Queensland peak and this is adjusted from time to time to provide for the Australian requirements plus the tonnage allowed for export under the sugar agreement.

To this extent the industry would appear to be nicely organised and controlled and there should be neither a glut nor a shortage. But that is leaving the weather out of consideration. Cane growing, like any form of farming, is dependent to some extent on the vagaries of the season, and the Queensland coastal strip is not exempt from seasonal variation. On the contrary, it is a zone which is subject to cyclones and floods in the more tropical sections and to droughts and frosts in the southern portion of the strip. In assigning acreages which might be expected to produce the sugar peak the authorities charged with that duty have wisely assigned sufficient land to enable the peak to be reached in a year of average production. It is axiomatic that in a bounteous year the peak will be exceeded and that in a subnormal season there will be a shortage of sugar cane. That is unavoidable and no type of farming endeavour could produce precisely each year the amount which the market would require.

So it is the seasonal variation which is responsible for the fluctuating supply of sugar and, since the market is virtually constant, it is obvious that in some years, oversupply must occur. This is not the first year it has happened, nor will it be the last. On two previous occasions, 1953 and 1957, fortuitous circumstances allowed the harvesting of the entire crop when, earlier

* Broadcast over the ABC network on December 14th, 1958.

in each season, it appeared that there would be a large surplus. In the first of these instances Queensland was able to take up some deficiencies in production in other British Commonwealth sugar producing countries and thus make up the export quota allowed by the British Commonwealth Sugar Agreement. On the second occasion when we had quite serious overproduction we were saved by a clause in the International Sugar Agreement whereby the quotas became inoperative when world prices exceeded a certain ceiling figure; on that occasion we were able to sell about 100,000 tons of sugar to Japan, which amount was over and above the normal allowable export.

But today world prices are down again and the quotas will operate strictly according to the agreement. We have a large surplus which might reach 600,000 tons of sugar cane or 80,000 tons of sugar and so long as we abide by the International Sugar Agreement, and participate in the stability which that agreement confers, we have no outlet on the world market.

Keeping in mind the industry controls which I have mentioned it was almost inevitable that today's position would be reached. The sugar industry, rightly and justifiably, continues to strive for higher efficiency, and its unalterable target is to produce more sugar per acre and to reduce the cost of producing each ton of sugar. Putting it concisely, efficiency in production has outstripped the growth in markets. If we also recall that our productive area has been tailored to fit the markets in an average year then it must be accepted that in bounteous years the surplus will have to be faced.

And even if areas are stabilised at today's figures there will continue to be an increase in the tonnage of sugar cane grown. A higher standard of farm husbandry is evolving as the result of marrying s c i e n c e to agriculture. Serious crop-destroying pests are being controlled, diseases are being eradicated one by one, and the advance of cane breeding is so rapid that there is a continuing change to better and better varieties. It is this latter factor which is the one of greatest importance.

At no time in the industry's history has the varietal scene been more attractive, and there are new results of the cane breeders' efforts appearing each year. Not only are higher yielding canes replacing less productive ones but some of the newer types are of higher sugar content. Special purpose canes to resist high winds and floods are being bred, thus reducing the losses previously caused by climatic factors. One result of the successful cane breeding is that the effects of abnormal climatic occurrences are today becoming less than formerly. A decade or so ago a dry year could virtually cause a crop failure in South Queensland; now the hardier canes grown can produce reasonably under very harsh conditions. Cyclones which once devastated wide areas in the north are not now so destructive on the varieties being planted. Flood submerged cane crops are not necessarily lost in these days since there are cane types available which can survive submergence for several days. Increasing attention is being given to lodging resistant varieties because an upright crop develops a higher sugar content and is cheaper to harvest. All these factors are tending to stabilise production and to level out the production curve; in other words the cane breeder is not only increasing the average yield but is also ironing out some of the worst of the production falls caused by seasonal effects.

What is to be the result of these improvements in the forthcoming years, and what can the industry do to avoid a succession of surpluses? There is little doubt in my mind that, with the existing restricted markets for our sugar, we must expect a frequent recurrence of this problem. The

sugar producing lands are not yet nearly at the peak of production, even with the present day farm practices and cane varieties. If each grower in the industry were taking full advantage of the best canes available, and growing two ratoon crops, production could appreciably exceed this year's output. And since there is no indication that varietal improvement is slowing down—rather the contrary—it can be accepted confidently that the capacity of the land to produce will be higher in the future than it is today.

Let us not forget the factor already mentioned—the all important one of the season. The year 1958, although recording the highest production ever achieved, was not a bounteous year in all areas. There were serious and damaging floods in some districts, and there was a delayed wet season in others. Given good growing conditions in all sections of the sugar belt, there could be a far larger crop than has been the case this year.

The future will undoubtedly give us more problems to face up to, and over-production will not be the least of them. But if we take a realistic view we will keep in mind that the production of surplus cane can have its good as well as its bad points. Unlike the orchardist or the vegetable producer, the cane grower does not appreciably alter the price of his cane when he grows too much. In other words the price per ton remains virtually the same but he does not sell more than the allowable quota. If he plants his permitted area he has a good chance of selling his production in an average year. If the year is bounteous and his crop is larger, the surplus is grown at no extra cost. And although no one appreciates having to plough in unwanted cane, it is probably more acceptable to do this than to be faced with a sub-normal season and insufficient to fulfil his quota.

It is not so easy to crush all the cane in a year of plenty and to store the sugar against a year of shortage. Raw sugar is a perishable product which does not keep well in a humid environment. One must also keep in mind that in a succession of good seasons such as the industry has enjoyed in recent times, the surpluses would snowball and the industry's economy could be seriously harmed.

Should the years of over-production become more frequent the sugar industry organizations will doubtless give serious consideration to measures which might ameliorate the problem. But the matter is a rather complex one and a solution will not be simple. Technical efficiency cannot be thrown overboard so that production per acre can be lowered. Rather would it seem that the answer will lie in acreage restriction until such time as markets catch up with the sugar being produced.

I.S.S.C.T. Congress in Hawaii

Dr. W. A. T. Summerville, Under Secretary for Agriculture and Stock and Deputy Chairman of the Sugar Experiment Stations Board, will attend this Congress in May, 1959. The Bureau will be represented by Mr. R. W. Mungomery (Asst. to Director) and Mr. R. Deicke (Senior Mill Technologist).

The Bureau's New Building

On December 4th, 1958, a large gathering of sugar industry and commercial representatives gathered at Gregory Terrace, Brisbane, to witness the official opening of the Bureau's new administrative building. Among the gathering were industry leaders from all districts from Mossman to the Northern Rivers of New South Wales, representing mills, growers' organizations and pest and disease control boards. In addition, such bodies as the Queensland Cane Growers' Council, Australian Sugar Producers Association, Sugar Board, Sugar Research, Colonial Sugar Refining Co., Proprietary Millers, Cane Prices Board and Department of Agriculture and Stock were present, as were representatives of a large number of commercial firms.

The Hon. the Premier, who performed the opening ceremony was introduced by the Hon. the Minister for Agriculture and Stock who is also Chairman of the Sugar Experiment Stations Board; the opening was followed by an inspectional tour of the building.

The new headquarters of the Bureau is sited on half an acre of land in a high and commanding position on Gregory Terrace. It is L shaped and consists of two stories at the front and three at the rear, with a total floor area approximating 18,000 sq. feet. Every effort has been made to design the laboratories along the most modern lines with a view to providing first class research facilities and working conditions.

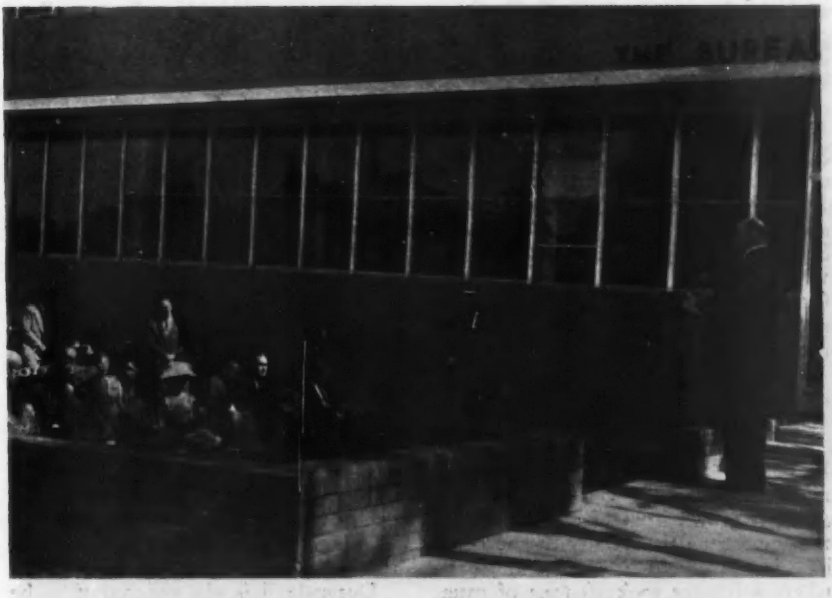

Fig. 43—The Hon. O. O. Madsen, Chairman of the Sugar Experiment Stations Board, addresses the gathering at the opening of the new building.

INTRODUCTORY ADDRESS BY THE HON O. O. MADSEN

Minister for Agriculture and Stock and Chairman of the Sugar Experiment Stations Board

The Bureau, whose administrative building is to be opened today, had its beginnings in 1900 when the Sugar Experiment Stations Act of 1900 received Royal Assent.

The Bureau was established at the request of the sugar industry, and the first moves were initiated by the Bundaberg Planters and Farmers' Association which approached the Government to establish Sugar Experiment Stations.

The Government of the day passed the necessary Act and the Bureau was financed by a levy on each ton of cane, paid equally by grower and miller, and subsidised £ for £ by the Government. This arrangement continued until 1933, when, at the request of the industry for a greater degree of control of the Bureau the Government established an Experiment Stations Advisory Board with four industry and two Government representatives and simultaneously limited the Government subsidy to a maximum of £7,000 per annum. Later, in 1951, as the result of agitation from the industry, the Bureau was taken away from Public Service control and a Sugar Experiment Stations Board was created to control the policy of the Bureau's activities. This Board consists of the Minister and the Under Secretary for Agriculture and Stock as well as one representative each of the Queensland Cane Growers Council and the Australian Sugar Producers Association.

At the time the Bureau was established in 1900 Queensland's cane production was a mere 800,000 tons; today it approximates to 10,000,000 tons. In that period, as the result of technical assistance, the yield of cane per acre has grown from 12 to 26 tons. At the same time the quality of the cane has improved to such extent that, whereas it once took 10 tons of cane to make a ton of sugar, it now takes only 7 tons.

During the half century or more the major insect pests have been controlled and it is estimated that the industry is saved up to £500,000 a year by the control of these insects.

The worst diseases of the crop have either been eradicated completely or are under good control and here again major financial losses have been eliminated.

The industry has always supported the Bureau's target of higher efficiency and has approved the policy of overseas training and experience for its technical staff. Seventeen staff members of the Bureau, including five Directors, have had overseas training or experience, and the industry is now benefiting from this long-range policy.

A significant point about the establishment and progress of the Bureau has been that, not only has the sugar industry agitated for the development, but it has been both willing and anxious to provide portion or all of the required cost. Today the industry finds approximately 96 per cent. of the funds contributed to the Bureau for its operations.

Sugar production can be classed today as the most stable of the primary industries and much of the credit for this must go to the industry itself for its insistence on research so that pests and diseases which cause calamities might be controlled, and so that varieties might be bred to withstand the ravages of floods, droughts and cyclones. The over production which has caused some concern this year is a result of this research—and the raising of efficiency per acre—; but although there have been many approaches to the Government to locate more markets for sugar it has never been suggested that research should be abandoned and that the growers return to lower acreage yields.

Queensland is claimed today to be the State which has the greatest potential for future primary development.

The sugar industry has set a pattern in both the research and the organizational fields. It has demonstrated without uncertainty that its self-help has earned handsome dividends and other primary industries could well follow the example set by financing research in their own fields and having less dependence on public funds. In the recent post-war expansion the sugar growers and millers showed their capacity to expand output by 30 per cent. in a short three or four years and, as Australian population grows and world sugar markets give Queensland the opportunity for increased export the industry will show again that it is geared for the extra production and that its research organization possesses the knowhow to increase production and to maintain costs at a fairly reasonable level.

The sugar industry has gone a long way in the exploitation of the soils capacity to produce but it has not yet reached the optimum. Fertilizer research, as conducted by the Bureau, can show the way to still higher yields and, even when the optimum may appear to have been reached there will be still further gains by using more suitably-bred cane varieties. Land for expansion in the sugar industry is not yet short, but increasing efficiency on existing farms is making less necessary the extension onto new areas.

When the Bureau was first established its headquarters were at Bundaberg under the then Director, Dr. Maxwell, but with his resignation in 1909 the headquarters were moved to the Department of Agriculture and Stock in Brisbane; they remained there until this year.

There are good reasons for the Bureau maintaining its administration in the capital city not the least of these being that the Director administers an Act of Parliament and, in so doing, requires frequent and close contact with my department. In addition it is necessary to maintain close liaison with other sugar organizations and with commercial firms dealing in agricultural chemicals.

I have very much pleasure in now requesting the Hon. the Premier, Mr. G. F. R. Nicklin, to open the building.

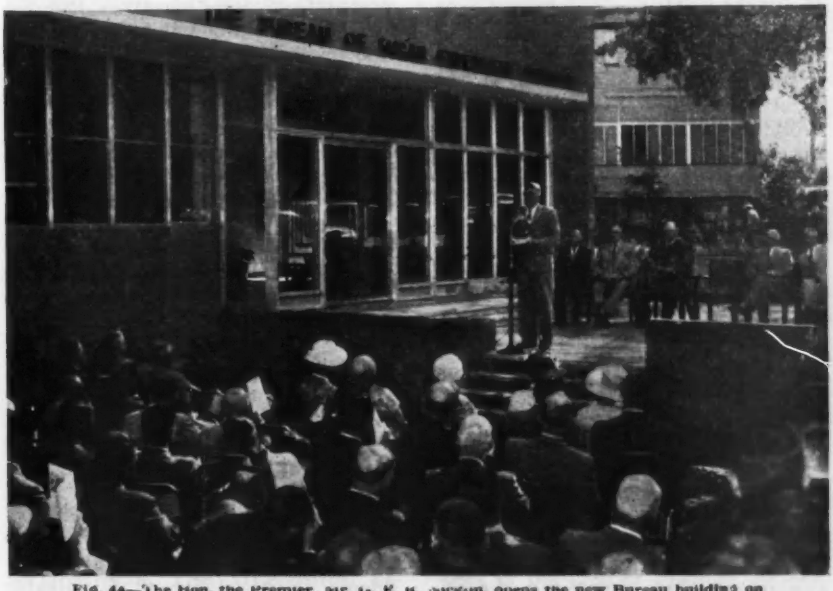

Fig. 44—The Hon. the Premier, Mr. G. F. R. Nicklin, opens the new Bureau building on December 4, 1958.

OPENING ADDRESS

BY THE HON. THE PREMIER, (MR. G. F. R. NICKLIN)

At the outset I would like to express my thanks for the invitation to officiate at this opening of the new home of the Bureau of Sugar Experiment Stations. Every member of this gathering knows the outstanding part the Bureau has had in the development of Queensland's great sugar industry, which this year has achieved the distinction of being the State's topmost primary industry. The sugar income this year exceeds the return from wool by some millions of pounds.

Sugar was the first primary industry in Australia to have its own research organisation, and, even today, there is no primary industry which devotes a similar proportion of its income to research and depends so lightly on Government assistance.

A survey of the last thirty years or more shows convincingly the enormous contribution that sound research has made to the meteoric rise in value of the sugar crop. The Bureau of Sugar Experiment Stations crowned its pioneering association with the sugar story by its outstanding contribution to the large scale expansion of the industry which followed the Second World War. Returned soldier settlers were not assigned land for cane growing unless the land had first been classed as suitable for cane growing; and a great deal of the expansion from 1950 to 1953 was based on land classification carried out by the Bureau staff. The success of this land selection work is demonstrated by the fact that every returned serviceman settled in the sugar industry has become a successful cane grower.

During the current year the industry has faced, for the first time, a serious over-production problem which has resulted in much cane being left unharvested. This is an unfortunate circumstance since more sugar was in sight than could have been sold on available markets and within the restrictions imposed by the International Sugar Agreement. But the over-production does emphasise the fact that, on the existing assigned land, increasing field efficiency is raising tonnage per acre. The Bureau's work in developing more vigorous cane varieties and in controlling diseases and pests has been an important factor in improving this efficiency. However, it would be agriculturally unsound to lower the efficiency standards because too much cane was being grown.

Until such time as increased markets are able to absorb all of our sugar production, growers should aim at maintaining their production on each acre of land and, if necessary, reducing slightly the area being planted. In this way the land will benefit from a longer rest and it will be to the ultimate gain of the farmer.

During the earlier days of the industry the cane growers' livelihood was dependent upon cane varieties imported from other countries and the relatively low production per acre was due to their unsuitability for growing in our climate. Queensland research workers have since changed that picture entirely and today 85 per cent. of the cane grown in this State is from varieties bred locally by the Bureau and the Colonial Sugar Refining Co. So different is the picture indeed that today there is a constant stream in the reverse direction; overseas sugar countries are importing our canes in an attempt to improve their own cane production.

From the plant breeder's point of view there is no real limit to improvement until the capacity of the plant to produce is limited by the amount of sunlight, rainfall and plant food. Our industry in Queensland can therefore look forward to still higher production per acre, and still sweeter canes, and the industry can have confidence in its ability to fill greater

Australian and export sugar markets as they become available. There is a double string to the bow—that of improved yields on each existing acre of assigned land and the fact that there is as yet no shortage of suitable land for further expansion.

Some of the still-living members of the sugar community would recall the origins of this organisation whose building is being opened today. Its first Director, Dr. Maxwell, gave up his position as Director of the Hawaiian Sugar Experiment Station to become the head of the Bureau in Queensland and he remained here for nine years to see it firmly established as a live force. Today the Bureau is leant on heavily by the industry in all technical and research matters and is acknowledgd as one of the outstanding Sugar Experiment Stations of the sugar world.

The new building consists of two floors and a basement, and provision has been made in the structural design for the addition of a further floor if required in the future. It has a reinforced concrete frame, and continuous concrete floors. Throughout the building false ceilings have been provided so that all piping, conduit and ventilation ducts are concealed. All the principal laboratories and offices face either to Gregory Terrace or Parish Street and they are equipped with a continuous row of aluminium framed windows which provide excellent natural light to all work areas. These windows are kept in shade for most of the year by the projecting concrete hoods.

The layout has been designed so that the laboratories have a south-easterly aspect, and the building has been erected at an angle to Gregory Terrace to take best advantage of natural light. It has been set back from both roadways. The upper floor has been devoted to administrative offices, library, conference room and staff amenities room, while the ground floor contains the laboratories and associated staff. This arrangement allowed water, gas and other services to come up from the basement, and for laboratory wastes to feed to the basement area.

The basement, which is extensive, was made possible by utilising the natural fall of the land, and contains the air conditioning machinery, several work and store rooms, the loading dock and a series of garages for off-street parking.

An unusual feature of the building is that it contains, on the roof, the Bureau's official quarantine glasshouse in which all imported cane varieties will be grown for a year before release to cane areas.

Inside the building the laboratories are designed along modern lines. The peninsula-type benches are topped with Kauri pine coated with clear Javal plastic; and the water, gas and electric services are concealed within the benches and operated by front controls. All sinks are of a special grade of stainless steel to withstand corrosive materials. Wastes from all sinks are of polythene piping. In the instrument and balance rooms anti-vibration benches will protect delicate instruments from vibration caused by heavy traffic.

Within the air conditioned building is a constant temperature room with its own air conditioning plant. This room will be kept at a uniform temperature of 20°C. for metrology and sugar analysis. It will house also the standard instruments used by the Bureau for calibration of such instruments and apparatus as are used by the mills for cane payment purposes.

Natural materials have been used extensively in the finish of the building. The paving outside the entrance is Helidon freestone; the foyer floor is polished marble mosaic; one wall of the foyer is panelled with bloodwood; and all doors within the building are of Queensland maple. On the other hand synthetic materials of modern design have been utilised for particular applications.

Use has been made of modern colours in the interior painting. In general the paint materials used are

washable enamels. The passageways are covered with rubber to reduce noise incidence, and all passages, as well as rooms where the noise level may be high, are ceiled with acoustic tiles.

The air conditioning plant will provide ideal working conditions for staff and is designed to provide warm air in the winter months as well as a cool atmosphere in the summer. Such rooms as the furnace room and the pathology autoclave room, which are not air conditioned, are ventilated by separate forced-draft systems.

I am sure that I speak for all present when I describe this building as a worthy addition to Brisbane's architecture. I must also commend the architects on their design and interior layout and all those who worked on its construction.

In conclusion I congratulate the Director, Mr. King, and his competent staff on the acquisition of a headquarters worthy of the contribution they continue to make in the welfare of the sugar industry. And I have very much pleasure in declaring this building open.

In proposing a vote of thanks to the Hon. the Premier, the Director, Mr. Norman J. King, said:—

It is my honour and pleasure to move a vote of thanks to the Hon. the Premier. Busy though he is, as first citizen of this State, he has paid a great tribute to the sugar industry by his attendance here this afternoon for the purpose of opening our new building.

Before doing so I would like to express thanks to the Hon. the Premier on behalf of the Bureau staff. It is a proud day for all of us. And it is a far cry from the humble beginnings in 1900—just 58 years ago this month—when the Bureau took over the State Nursery in Mackay and conducted its first work on a small experiment station with a modest laboratory. Today, thanks to the sympathetic and encouraging attitude of successive Governments—and to their financial support—and to the great sugar industry which has provided finance freely and willingly, we have four full-scale experiment stations and a pathology farm, and now this new, modern building as an administrative and research headquarters.

Our history has not been quite untroubled nor our way always smooth. Progress was slow in the first decades, and the dissemination of information to the industry was slower still. But the last thirty years have been full of achievement and it is very many years since any doubt has been voiced that the industry was not getting more than full value for its investment in research. Reference has been made this afternoon by the Hon. the Minister for Agriculture and Stock to the very large sum saved annually by the control of insect pests—a figure conservatively estimated at half a million pounds each year. But an even greater financial contribution has been made by the Bureau's cane breeding operations. Last year just one variety bred by the Bureau, Q.50, represented 2,400,000 tons of cane. It is calculated that, in the Mackay district alone, this variety has raised the productive capacity of the land by five tons per acre, representing about £4,400,000 extra annual income to growers and millers in that area. Since the Bureau's total expenditure since 1900 is less than £2,000,000 it can be readily seen that the Bureau has been a gilt edged investment for the sugar industry.

During the years of its existence the Bureau's staff has grown to its present total of 75 persons, and the major increase has been in the last ten years. This growth has followed the industry demand for improved services in the fields of plant nutrition, disease eradication, pest control, cane breeding, genetics and extension and advisory services. And the milling side of the industry has not been backward in its demands for research into manufacturing processes and investigation into day-by-day problems.

My reference to staff would not be complete if I failed to mention that one of the earliest members of the organization, who began work under Dr. Maxwell in 1901, is present here today; I refer to our old and valued friend Mr. C. H. O'Brien.

Some three to four years ago, when we began to plan a move from our previous quarters, consideration was given to the idea of a sugar house in Brisbane which would cater for the requirements of all the sugar organizations. However, there were considerable difficulties in the way of such a project and it was finally decided that we would proceed on our own and develop a Bureau headquarters building. Once decided, little time was lost. Our Board accepted the plan late last year; tenders closed and the successful one was accepted last December, and construction work began last January. Great credit reflects on Messrs. Goodsir and Carlyle, the architects, and K. D. Morris and Sons, the contractors, for the expeditious and satisfactory manner in which the work has been performed.

Our new laboratories provide vastly improved conditions and facilities for both routine and research activities. They have not been designed to cater for any large increase in research staff because it is our policy, as far as practicable, to look after increased technical demands by building up the technical personnel on our four experiment stations. But nevertheless, there is sufficient space here for expansion of laboratory staffs if it becomes necessary. New buildings do not, in themselves, improve the quality of the work performed but they do provide better working conditions and can be designed specifically for the type of research being carried out. This structure is air conditioned to give better working conditions, and an unusual feature is the glasshouse on the roof which performs the function of quarantine station for all sugar cane varieties imported into this State.

When our organization was established in 1900 the Sugar Industry was producing a mere one-tenth of present day output, and the then leaders of the industry could not have foreseen that, a little over half a century later, the industry would have grown to its present size. Nor could the industry leaders of the late nineties, who agitated for a research organization, have dreamed that in the same period the Bureau could have made such a large contribution to industry security and stability.

Even today the sugar industry is not a static one. It will continue to grow with increasing Australian and overseas markets and one of its strong points will be its high degree of technical efficiency. When the opportunity arises for further expansion the know-how is already available to extend our sugar production on to new lands and to ensure that the crops are well nurtured and protected against disease and pest attack.

During your inspection of the building this afternoon you will note that the plant pathology wing on the ground floor has been dedicated as a memorial to the late Arthur Bell who played the leading part in formulating the disease control policy of the Bureau for nearly twenty years. His contribution to the present-day well-being of the industry was an important one, and the bronze tablet which has been erected in the pathology wing will be a tangible reminder to us and to our successors of the high place which he made for himself in the sugar industry. I am confident that the industry as a whole will welcome and approve our action in erecting this commemorative tablet in the pathology section of the building.

May I conclude by repeating our thanks to you, Mr. Premier, for officiating at this function this afternoon, and by calling on all present to carry a vote of thanks by acclamation.

A Short Historical Survey

In a souvenir brochure which was distributed to guests at the opening of the Bureau's new building in Brisbane there was printed a short resumé of the Bureau and its work. This section of the brochure read as follows:

THE BUREAU AND ITS WORK

The Bureau of Sugar Experiment Stations is now in its fifty-eighth year of existence. Created by "The Sugar Experiment Stations Act of 1900" it was, until 1951, a government sub-department under the Ministry of Agriculture and Stock. In that year an amendment to the Acts removed the Bureau from Public Service control and, since that time, it has been administered by a Board representing the Government, the cane growers and the raw-sugar millers.

There have also been changes over the fifty-eight years in the sources of Bureau finances. Between 1900 and and 1934, the cane assessment which was contributed by the growers and millers, was subsidised £ for £ by the State Government. In that year the Government limited its annual contribution to £7,000 and, for the past twenty-four years the industry has borne an increasing percentage of the money required for maintaining the Bureau's operations. In recent years the industry has found some 96 per cent. of the funds required.

At the turn of the century when the industry was growing a mere 800,000 tons of cane the Bureau made a modest beginning with a sugar experiment station at Mackay and an administrative office and soils laboratory at Bundaberg. At the present time, with the industry producing more than ten fold the 1900 figure, the Bureau operates four full-scale experiment stations, a pathology farm, two seedling sub-stations, and has its administrative offices and laboratories in Brisbane.

It is fitting that, in retrospect, credit should be given to those early leaders who possessed the sagacity and foresight to advocate that a research organization, devoted solely to the sugar cane crop, should be established. With all their vision they could not have foreseen that, in something over half a century, Queensland would be the world's fourth largest cane sugar producer, nor that the Bureau for which they were responsible would have grown to its present important place in sugar technology.

The problems which, in the last century, inspired the creation of this research organization have been solved, but problems of equal or greater magnitude have arisen. The early advocates of the application of science to industry had in mind the industry's major insect pests, the formidable array of diseases, the poor selection of cane varieties then available, the need for research into soil fertility and plant nutrition and a means of solving the many cultivation problems allied to a changeover from coloured to white labour. These targets were reached. Some of the solutions were a long time in being found, but to-day the major pests are effectively and economically controlled, the worst diseases have been eradicated, the varietal position is so good that overproduction could become a serious threat, fertilizing is on a sound and intelligent basis, and cultivation processes are at a high level of efficiency.

But much remains to be done both to keep Queensland in its present place among the most efficient of world sugar producers and to keep costs down to such a level that the State's export production can continue to compete successfully on the British Commonwealth and world markets.

It was not until 1929 that the

Bureau extended its activities to embrace the field of sugar mill technology and it has contributed in no small way to processing techniques and milling problems since that time. Although results have not been so spectacular in this field as in those of pest and disease control and cane breeding the contributions have made a worthwhile impact on mill performances.

The building which is being officially opened to-day is worthy of the great industry which it serves. Circumstances of space and facilities made it necessary that the Bureau seek other quarters than those it has occupied for thirty years in the Department of Agriculture and Stock building. The growing demands of the industry for increased services, and the need for more office and laboratory space, influenced the Sugar Experiment Stations Board to embark on a project of constructing a building with modern facilities for laboratory investigation and research.

The sugar industry has been quoted on many occasions as an example which other primary industries in Australia might follow in regard to its research organization. Virtually independent of financial assistance from the Government the Bureau has made technical advances for the industry which far outweigh the money contributed for its maintenance. The breeding of a single cane variety of the quality of Q.50 has increased industry income by millions of pounds; and the control of the cane grub pest, which scourged the industry for decades, is conservatively estimated at saving upwards of £500,000 annually.

The close association between the Government and the Bureau has benefited the industry in no small way. The Bureau, in administering the Sugar Experiment Stations Acts is, by virtue of this association, enabled to exercise legislative control over diseases and pests, to approve or disapprove of the cane varieties which may be grown, and to carry out other functions aimed at industry efficiency.

This integration of State Government, research organization and industry, which exists in Queensland, is probably unique among the sugar industries of the world.

Termite Damage

At Bundaberg last spring, white ant damage to cane setts was more prevalent than usual. The species responsible was one of the smaller types, which had entered cane fields from their nests situated in adjacent timbered land. The damage consisted of eating the soft internal tissue of the setts causing subsequent death of the eyes or shoots.

The control measure employed was the recommended carbon bisulphide treatment of the nests. By this means, a hole was knocked in the top of the mound to expose the honeycombed interior and the liquid poured into a shallow container placed in the hole, which was then covered with a wet bag. The heavier-than-air vapour of the fumigant penetrated the passages of the nest killing all inhabitants.

(1) Coptotermes acinaciformis (Froggatt)

N. McD. S.

A Filter Mud Spreader

By N. McD. SMITH.

The use of filter mud on the marginal forest lands of Bundaberg is becoming rather commonplace for, in addition to the plant food supplied, the residual effect on these particular soils is beneficial. However, a limiting factor in its usage is the relationship between cost of the material plus cartage, and the plant food content. On analysis a ton of the wet mud contains the equivalent of 56 lb. superphosphate and 2¼ lb. of potash, which limits the economic usage of the mud to those farms situated close to mills.

One grower, after his return from a Mackay visit, suggested to a local haulage contractor that one of his trucks be fitted with a spreader similar in operation to those seen at Pleystowe. The local adaptation, which is illustrated, has given most efficient service.

Usually the practice is to dump the material in heaps over the field, and quite a period might elapse before distribution takes place. In doing so, some inconvenience is caused and, later, the position of each heap is oftentimes marked by better growth of cane. This demonstrates an improper distribution, and introduction of the spreader has, at least, eliminated this disadvantage. The fact is quite important, for the material is worthwhile only if used efficiently.

FIG. 45—Showing the operation of the filter and spreader on the rear of a motor truck.

As shown in the photograph, the ribbed roller is driven from the rear wheel of the truck by a sprocket and chain. The mechanism does a satisfactory job with rate per acre controlled by the angle of the hydraulically-operated body to which the driver soon becomes accustomed. The limits obtained during the 1958 season were from ten tons per acre to 75 tons per acre, the latter being achieved by lifting the tailboard which normally acts as a stop when the body is tipped.

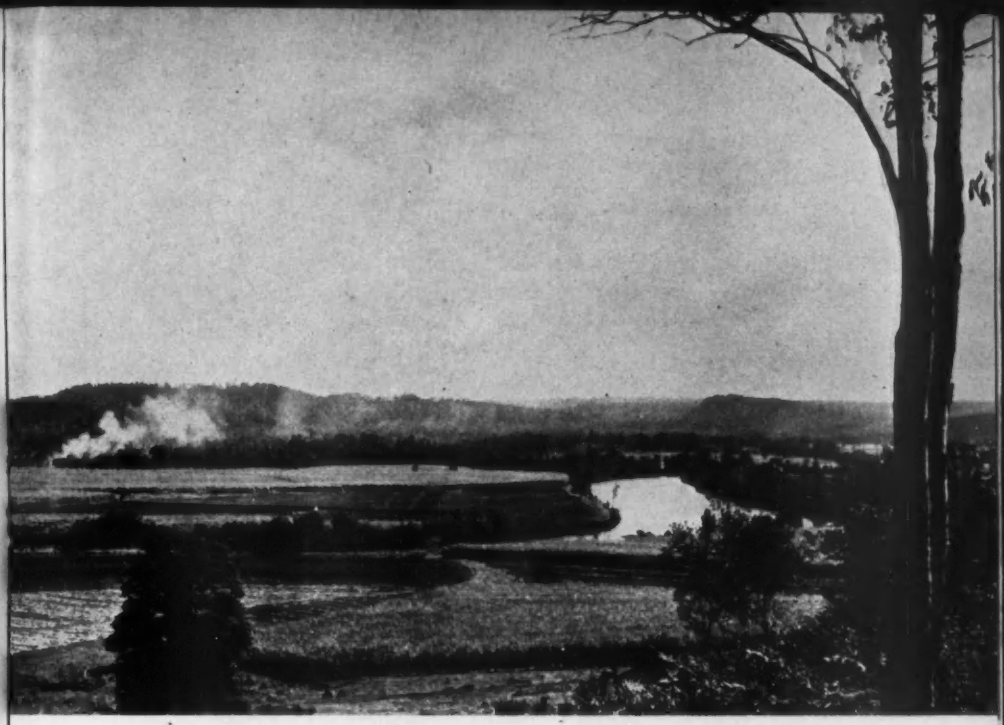

Fig. 46—Maroochy River cane lands.

Fig. 47—Marian Weir on the Pioneer River near Mackay.

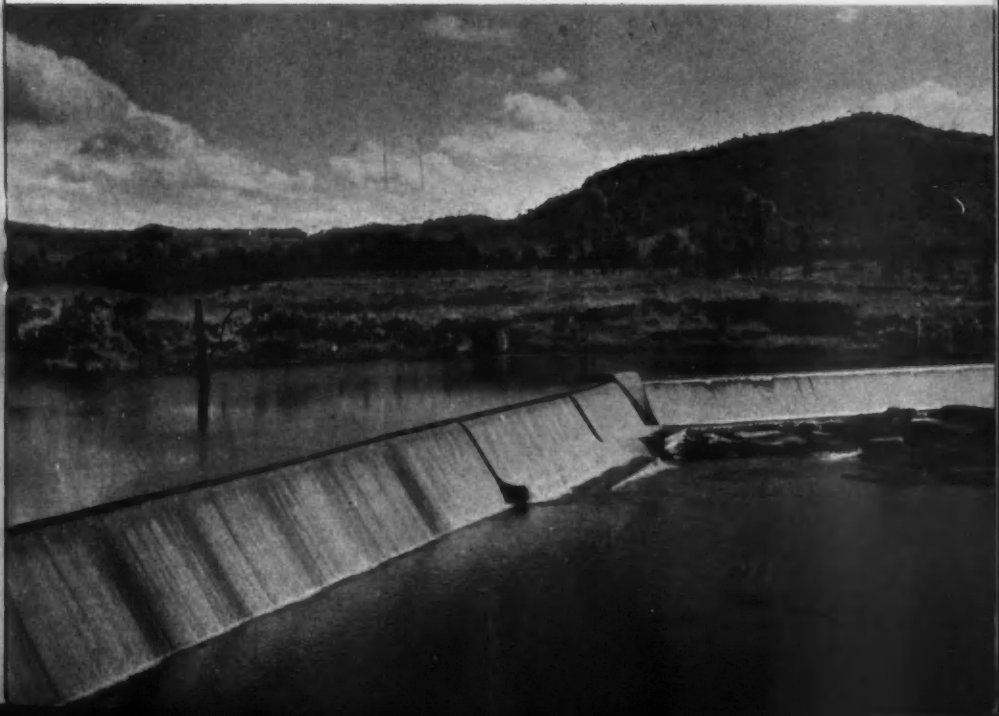

Fig. 48—The entrance vestibule is paved with marble mosaic.

Fig. 49—The memorial tablet in the pathology wing in the new building is examined by Mrs. Bell and the Premier.

Fig. 50—The pathology laboratory.

Fig. 51—At the opening of the new building. Left to right: Mr. L. G. Scotney, Mr. J. W. Inverarity, the Hon. O. O. Madsen, the Hon. G. F. R. Nicklin, Mr. N. J. King, Dr. W. A. T. Summerville, Senator B. Courtice.

Fig. 52—North Johnstone river from Goondi sugar mill.

Fig. 53—South Johnstone cane lands west of the mill.

Improved Germination of Hot Water Treated Cane

By J. H. BUZACOTT.

The germination of some cane varieties after long hot water treatment to control ratoon stunting diseases leaves much to be desired. It has been established that, in the far north at least, cane which is treated from August onwards germinates much better than that treated earlier in the season. This poses a serious problem for those farmers with high land farms because at that time of the year soil moisture may not be sufficient to germinate the plants. This particularly applies to those farms on the drier volcanic, red schist, or sandy soil types.

Fig. 54—Showing the good germination of hot water treated cane planted in dry soil in September and watered.

Important factors in securing a better germination of those varieties which respond badly to hot water treatments are the provision of a good seedbed and the application of water. In the far north the number of farms which have irrigation facilities is negligible but it is not generally realised that only a very small amount of water is necessary when applied to the plants in the drill, to stimulate germination. For years it has been the practice of the Bureau, when planting small trials late in the season on moisture-deficient land, to apply a small amount of water to the plants in the drill before covering with soil. Applied by watering can or by hose, forty-four gallons of water is sufficient for approximately a ten chain row of cane plants. It is a relatively simple matter to pull a 44-gallon drum of water with a tractor and trailer or slide and the results justify the extra labour involved. No means of ensuring a better germination should be overlooked for not only is hot water treatment time-consuming, but failure to establish a treated plot may result in a farmer having to purchase clean plants in the following year.

The accompanying picture shows an excellent germination of cane following long hot water treatment and planted in September on a dry red schist soil at Gordonvale. The plants were watered in this instance by a novel method. The spray nozzles were unscrewed from a cutter planter fitted with a mercurial spray. The 8-gallon tank on the planter was filled with water and the water pumped straight down the chute whilst the hot-water-treated setts were being dropped through it. This method proved quite effective and was certainly simple.

Planting Seedlings — Innisfail Sub-Station

By S. O. SKINNER

In previous issues of the *Quarterly Bulletin*, articles have been published on the two seedling sub-stations which have been established in Innisfail and Babinda. These are designed to cater for the "Wet Belt" from Tully to Babinda by facilitating the annual introduction of large numbers of untried canes for propagation and selection under the particular conditions of the belt.

Fig. 55—Each stalk is a different variety to be cut into two setts.

The accompanying photograph shows planting in progress during 1958 in Innisfail of approximately 1,000 introductions. Each stalk is a different variety. Tagged and known by numbers only, the stalks, after careful checking and recording, are cut into two setts.

Within the sub-station, the seedlings pass through several years of selection and replanting, during which heavy culling takes place. The better canes then pass to farms for final trial and rapid multiplication on all soil types. Already several canes of considerable promise have emerged and there is little doubt that the two sub-stations will play an important role in providing valuable canes of the future.

Initiative

By C. L. TOOHEY.

During the early stages of the Second World War, an American general is reported to have asked his Australian counterpart how Australian troops fought so well, lacking as they did the high powered and abundant weapons of their allies. The reply, given in a word, was "Initiative".

Whether the report is true or false, initiative is one of the cane grower's most valued weapons. This is probably more true to-day than ever before in the now unceasing war against production costs, and the vagaries of the seasons. Two more instances of the application of this seemingly universal commodity of the Queensland cane farmer were provided by Mr. P. V. Cronholm, of Bli Bli, in the early months of 1958.

Faced with the eradication of winter weed (*Ageratum conyzoides*) in out-of-hand cane, Mr. Cronholm was set the alternative of either chipping the fields or spraying it with weedicide from a knapsack spray. Either method would have proved extremely tedious, and time and money consuming. The grower decided to provide himself with a cheaper and much easier way out of the difficulty.

A 12 gallon drum was mounted in angle iron, horizontally on a clutch-driven motor mower, powered by a one h.p. engine. Attachment ot the mower was by four bolts, simplifying removal and mounting of the drum as required.

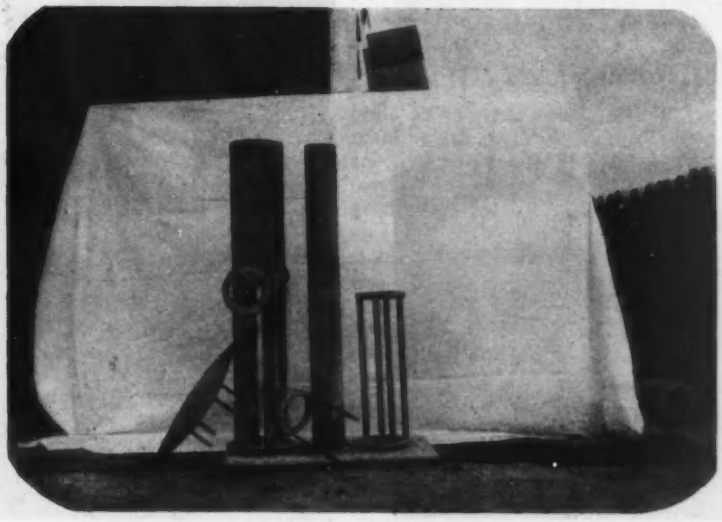

Fig. 56—Components of the pipe making machine.

Twin telescopic booms led upwards from the machine, allowing for adjustment to extend over cane tops six to ten feet in height, and extending over each immediately adjacent row; they were provided with four-foot droppers, each carrying two nozzles set to lay an over-lapping spray pattern; these droppers reached to within

15 inches of the ground. Immediately behind the machine two identical nozzles were placed to cover the row. Connection between boom and droppers was by means of a strip of rubber hosing. This allowed for any lurching of the machine on uneven ground, and prevented damage to nozzles striking unseen obstacles.

Spray solution to the booms was fed by a geared pump, fitted with a by-pass to allow for continual agitation of the liquid. Pressure of the spray was regulated by the mower's control lever spring.

To overcome the scratching of arms and legs of the operator in head-high cane, and to facilitate movement, wings of bird cage wire netting were mounted on 1in. x ⅛in. flat iron immediately behind the machine.

Spraying was carried out far more quickly—three rows as against one—much more easily, and at a considerable economic saving. Nine acres were treated in a day, as against the usual two and one-half acres by knapsack. All blocks treated by the machine resulted in an excellent kill of weed, comparable in every way with those done by knapsack. The method is, of course, not confined to winter weed. Control of nut grass, bell vine, star-of-Bethlehem, and any of the broad-leafed weeds in big cane is also simplified by use of the machine.

Fig. 57—The complete spraying machine and some of the cane it traversed.

Fig. 58—The pipe being ejected from the machine.

Not satisfied with economy achieved in one sphere, Mr. Cronholm decided that a considerable saving on concrete drainage pipes needed for a hillside block, could also be effected. Accordingly he constructed his own pipe-making machine.

To a base of one-half inch steel plate was welded a black, bore casing pipe of four inch outside diameter. Over this was dropped another pipe of six inch inside diameter. To the latter were welded four lugs by which it could be bolted to the base plate. The

pipes were centred by three grub screws.

Between the pipes was dropped an ejector fashioned of two machined rings, seven-eight by one-half inch, separated by four, three-quarter inch, spacing rods. Inclusive length between the rings was eighteen and one-quarter inches.

Slots, one inch wide, were cut in opposing sides of the outside pipe to allow the use of a Wallaby jack under the ring of the ejector. The jack was bolted to the base plate by two bolts, and held to the cylinder by an outside band.

In practice, the ejector was dropped between the cylinders, and on top of this was slipped a 24 gauge ring. The latter was found to be necessary for removal of the finished pipes from the machine. The concrete mixture of gravel, fine river sand and cement ($2\frac{1}{2}$: $2\frac{1}{2}$: 1) was then added and rammed.

The ejector was then raised by means of the jack. Although it was found necessary in the casting of the first pipes to use two jacks, adjustment of the water/cement mixture resulted in a single jack being sufficient. The pipe was then removed on the ring and allowed to harden. Sufficient rings had to be available to ensure no lag in production. Length of the finished pipe was twelve inches, a fraction longer than those of commercial manufacture.

Some warping of the first pipes cast occurred due to "dryness" of the concrete mixture. The use of a moister mixture remedied this in subsequent batches. Quality of the finished product was excellent and bore the closest comparison with pipes of professional make.

A second machine to make six inch pipes was also built, using cylinders of six inch outside, and eight inch inside diameters. Although built as a separate unit, both the small and the larger machine could, if desirable, be built on the one base plate. Cost of manufacture was £35 and £40 respectively. It is felt that scope of the machine could be safely increased to produce pipes up to 12 inches in diameter.

Once an ordered pattern of work was established, two men had little trouble in turning out 150 six inch or 200 four inch pipes a day. Records of all costs, including labour, were kept. Dependent on availability of sand and gravel, costs could be kept to less than half of the commercial article.

Q.57 in Babinda

Q.57 represented over a quarter of the Babinda crop in 1957 and exceeded in tonnage per acre the major variety, Pindar, by 31 per cent. This proportion of Q.57 had an appreciable effect on the average c.c.s. for the season since its average sugar content exceeded that for Pindar and Badila—the two major varieties—by 0.66 and 0.50 units respectively. It is pleasing to record that the growers of this area —which had experienced such low c.c.s. figures for a period of years—had followed Bureau advice to increase Q.57 plantings with a view to raising the average sugar content. Q.57 appears to be ideally suited to much of the Babinda area and it has proved its capacity to increase yields of cane while at the same time developing a sweeter juice.

It is a long time since the Babinda area began a season with higher c.c.s. than the neighbouring northern mill areas. Such was the case at the start of the 1958 season and much of the credit must go to the even higher proportion of Q.57 in the crop than is recorded above for the previous year.

Phytophthora Wilt of Velvet Beans

By B. T. EGAN.

During the last five years, velvet beans have become increasingly important to cane farmers as a reliable green manure crop. This was due in no small measure to the fact that they suffered from relatively few diseases, and so could generally be relied upon to product a crop which would grow through the wet season. On the other hand, cowpeas—the crop they were replacing—were very susceptible to stem rot disease which caused heavy losses whenever the soil became waterlogged.

Fig. 59—A field of velvet beans affected with wilt.

In January, 1957, a stem rot and wilting of velvet beans was seen in a well grown crop at Aloomba, near Gordonvale. Within two months the disease had spread rapidly through the block until over half of the 20 acres of beans had been killed. In February and March, 1958, blocks at Sawmill Pocket and Freshwater, near Cairns, also developed the disease. In the former case, approximately 4 acres of beans were killed; in the latter, a mixed velvet bean-Reeves cowpea stand, practically all the beans were killed, leaving a pure stand of Reeves.

Symptoms to look for are patches of dead velvet beans, with a band of yellowed and wilted plants around them. Generally the disease will progress on an irregular front from the centre of infection, killing all the beans. These yellowed or wilted plants should be examined for a blackening of the stem at and above ground level. It is the death and drying out of tissues in this blackened area which causes the whole plant to yellow and die. Similar black lesions can often be found at some nodes on the branches.

The fungus causing the disease is *Phytophthora drechsleri*, which has not been recorded in Australia previously. However, a similar disease has caused heavy losses in South Africa in recent years, and circumstantial evidence suggests that the

disease was introduced from that country, since imported seed was used to plant the diseased blocks. No varieties tested proved resistant, and as the disease can live in the soil for a long time, it could prove as serious a threat to velvet beans as stem rot is to cowpeas.

A New Angle on Giant Sensitive Plant Control

The control of giant sensitive plant in the sugar belt requires a two-pronged attack. One part of the campaign is the destruction of the existing seed beds and the eradication of every known plant; the other is the prevention of any further seed entering Queensland.

Although both State and Commonwealth authorities have legislated to ensure that all Centro seed entering the country will be cleaned of any giant sensitive plant seed, such precautions are not 100 per cent. effective, and there is always the risk that Centro seed planted as a pasture legume may contain a few of the small seeds of giant sensitive plant.

Why, therefore, cannot our requirements of Centro seed be grown and harvested locally and the import trade die through lack of demand?

Mr. J. Murray, a grazier in the Herbert River district, has demonstrated that such a proposal is practicable. During 1958 he harvested 2,500 lb. of *clean* Centro seed with an Allis Chalmers "All Crop" harvester. It is his intention to develop this project to ensure regular supplies of clean seed for his personal use; but it is hoped that he will consider the advisability of supplying seed to other Queensland users.

Fig. 60—The "All Crop" harvester working in a field of Centro near Ingham.

Bureau officers at Ingham inspected the Centro planting during its growth and immediately prior to harvesting the seed. This precaution was taken to make sure that no giant sensitive plant was present.

This is an excellent example of self-help in tackling a difficult weed-pest problem.

O.W.D.M.

"The Sugar Experiment Stations Acts 1900 to 1957"

LIST OF VARIETIES OF SUGAR CANE APPROVED FOR PLANTING, 1959.

Bureau of Sugar Experiment Stations, Brisbane, 1st January, 1959.

Mossman Mill Area

Badila, Clark's Seedling, Co.475, Comus, Pindar, Q.44, Q.50, Q.57, Q.59, Q.64, Q.66, S.J.4, Trojan and Vidar.

Hambledon Mill Area

Badila, Badila Seedling, Comus, Eros, Pindar, Q.50, Q.57, Q.59, Ragnar and Trojan.

Mulgrave Mill Area

Badila, Badila Seedling, Cato, Co.475, Comus, Eros, Pindar, Q.44, Q.50, Q.57, Q.59, Q.64, Q.66, S.J.4, and Trojan.

Babinda Mill Area

Badila, Badila Seedling, Clark's Seedling, Co.475, Comus, Pindar, Q.44, Q.50, Q.57, Q.59, Q.64, Q.66, Trojan and Vidar.

Goondi Mill Area

Badila, Badila Seedling, Castor, Pindar, Q.44, Q.57, Ragnar, Trojan, and Vidar.

South Johnstone Mill Area

Badila, Badila Seedling, Clark's Seedling, Pindar, Q.44, Q.57, Q.59, Q.64, Trojan and Vidar.

Mourilyan Mill Area

Badila, Badila Seedling, Clark's Seedling, Pindar, Q.44, Q.50, Q.57, Q.59, Q.64, Trojan and Vidar.

Tully Mill Area

Badila, Badila Seedling, Clark's Seedling, Pindar, Q.44, Q.50, Q.57, Q.59, Q.64, Trojan and Vidar.

Victoria Mill Area

Cadmus, Eros, Luna, Pindar, Ragnar, Sirius, Trojan, Q.50, Q.57 and Q.58.

Macknade Mill Area

Cadmus, Eros, Luna, Pindar, Ragnar, Sirius, Trojan, Q.50, Q.57 and Q.58.

Invicta Mill Area

North of Townsville.

Badila, Eros, Pindar, Q.50, Q.57, Q.58, Ragnar, and Trojan.

South of Townsville.

Badila, Clark's Seedling, Comus, Pindar, Q.50, Q.57, Q.67, S.J.16, and Trojan.

Inkerman District.

Badila, B.208, Clark's Seedling, Comus, E.K.28, Pindar, Q.50, Q.57, S.J.16, and Trojan.

Pioneer Mill Area

Badila, Clark's Seedling, Comus, Pindar, Q.57, Q.67, S.J.16 and Trojan.

Kalamia Mill Area

Badila, Clark's Seedling, Comus, Pindar, Q.50, Q.57, Q.67, S.J.16, and Trojan.

Inkerman Mill Area

Badila, Clark's Seedling, Comus, Pindar, Q.50, Q.57, Q.67, S.J.16, and Trojan.

Proserpine Mill Area

Badila, C.P.29/116, Comus, N.Co.310, Pindar, Q.28, Q.45, Q.50, Q.56, Q.57, Q.58, Q.63, Q.65, Q.68 and Trojan.

Cattle Creek Mill Area

Badila, C.P.29/116, Comus, N.Co.310, Pindar, P.O.J.2878, Q.28, Q.50, Q.56, Q.57, Q.58, Q.63, Q.65, Q.68, and Trojan.

Racecourse Mill Area

C.P.29/116, N.Co.310, Pindar, P.O.J.2878, Q.28, Q.50, Q.56, Q.57, Q.58, Q.63, Q.65, Q.68, and Trojan.

Farleigh Mill Area

Badila, C.P.29/116, Comus, N.Co.310, Pindar, P.O.J.2878, Q.28, Q.45, Q.50, Q.56, Q.57, Q.58, Q.63, Q.65, Q.68, and Trojan.

North Eton Mill Area

Badila, C.P.29/116, N.Co.310, Pindar, P.O.J.2878, Q.28, Q.50, Q.56, Q.57, Q.58, Q.63, Q.65, Q.68, and Trojan.

Marian Mill Area

Badila, C.P.29/116, Comus, N.Co.310, Pindar, P.O.J.2878, Q.28, Q.45, Q.50, Q.56, Q.57, Q.58, Q.63, Q.65, Q.68, and Trojan.

Pleystowe Mill Area

Badila, C.P.29/116, N.Co.310, Pindar, P.O.J.2878, Q.28, Q.50, Q.56, Q.57, Q.63, Q.65, Q.68, and Trojan.

Plane Creek Mill Area

C.P.29/116, N.Co.310, Pindar, P.O.J.2878, Q.28, Q.50, Q.56, Q.57, Q.58, Q.63, Q.65, Q.68, and Trojan.

Qunaba Mill Area

C.P.29/116, N.Co.310, Pindar, P.O.J.2878, Q.47, Q.50, Q.55, Q.58, Q.61, Q.70, and Vesta.

Millaquin Mill Area

C.P.29/116, N.Co.310, Pindar, P.O.J.2878, Q.47, Q.50, Q.55, Q.58, Q.61, Q.70, and Vesta.

Bingera Mill Area

C.P.29/116, Co.290, N.Co.310, Pindar, P.O.J.2878, Q.47, Q.49, Q.50, Q.55, Q.58, Q.61, Q.70, and Vesta.

Fairymead Mill Area

C.P.29/116, Co.290, N.Co.310, Pindar, P.O.J.2878, Q.47, Q.49, Q.50, Q.55, Q.58, Q.61, Q.70, and Vesta.

Gin Gin Mill Area

C.P.29/116, N.Co.310, Pindar, P.O.J.2878, Q.47, Q.49, Q.50, Q.55, Q.58, Q.61, Q.70, and Vesta

Isis Mill Area

C.P.29/116, N.Co.310, Pindar, P.O.J.2878, Q.47, Q.50, Q.51, Q.55, Q.58, Q.61, Q.70, and Vesta.

Maryborough Mill Area

C.P.29/116, Co.290, Co.301, Pindar, P.O.J.2878, Q.28, Q.47, Q.49, Q.50, Q.51, Q.58, Q.61, N.Co.310 and Vesta.

Moreton Mill Area

C.P.29/116, N.Co.310, Pindar, Q.47, Q.50, Q.58, Q.61, Q.70, and Vesta.

Rocky Point Mill Area

C.P.29/116, N.Co.310, Pindar, Q.28, Q.47, Q.50, Q.61, Trojan, and Vesta.

NORMAN J. KING,
Director of Sugar Experiment Stations.

Approved Fodder Canes

Bureau of Sugar Experiment Stations,
Brisbane, 1st January, 1959.

All farmers are advised that the following are the varieties of cane which may be grown for fodder purposes in the sugar mill areas as set out below:—

Mossman, Hambledon, Mulgrave, Babinda, Goondi, South Johnstone, Mourilyan, Tully, Victoria, Macknade, Invicta, Pioneer, Kalamia, and Inkerman Mill Areas:

China, Uba, Co.290, "Improved Fodder Cane," and Co.301.

Proserpine, Cattle Creek, Racecourse, Farleigh, North Eton, Marian, Pleystowe, and Plane Creek Mill Areas:

China, Uba, "Improved Fodder Cane," and Co.301.

Qunaba, Millaquin, Bingera, Fairymead, Gin Gin, Isis, Maryborough, Moreton and Rocky Point Mill Areas:

China, 90 Stalk, "Improved Fodder Cane," C.S.R.1 (also known as E.G.), Co.301, and Q.60.

NORMAN J. KING,
Director of Sugar Experiment Stations.

The Massey-Ferguson Harvester

By NORMAN J. KING

Considerable interest has been aroused in sugar circles in recent times regarding the research by one of Australia's leading tractor and implement companies into mechanical harvesting of cane.

In 1957 at North Eton and during 1958 in Ingham the Massey-Ferguson cane harvester was demonstrated on several occasions, but it was not until October, 1958, that a public demonstration was arranged. Some of those who witnessed the trials were able to recall two other machines which had operated on a somewhat similar idea —the cutting of the cane into short lengths and the conveying of the cut-up stalks into bins mounted on tramway truck chassis; these were the Falkiner and the Howard harvesters, neither of which reached the stage of commercial usage in Australia.

At the time of the recent demonstration with the Massey-Ferguson, the Managing Director of the Company, Mr. L. T. Ritchie, released a statement, in the course of which he said:—

"It is the only one in the world that combines the three functions of cutting, topping and loading in a continuous operation. What is more, it will halve growers' costs for those three functions.

"The unstinted praise for the machine vindicated the Company's faith in a pioneering project which already has cost £50,000 and would cost more than three times that amount before any cane harvesters were sold."

Mr. Ritchie went on to say that "Three years ago I saw the growers and blacksmith crusaders trying to help themselves by developing machines to cut cane because there was a need to reduce the rising risks in both the cost and availability of hand labour. Our investigations proved that several other factors were important. Mills were concerned about the increasing trash left by hand topping. Mills were critical of the dirt gathered by prevalent loading methods. Mills also were critical of careless loading, with resultant increase in spills and maintenance. Growers were worried by increasing problems with their cutting crews, threat of strikes, interference with mill schedule deliveries, unstable rates, etc.

"Our idea of cane harvesting was to provide the mechanical means of topping, cutting and loading at about half the cost of hand cutting, and at the same time to eliminate dirt, dust, rocks, sticks and all foreign matter, except a minimum of leaf and tops.

"The performance of the prototype machine indicates that its conception was correct. Sugar industry research and our test work during the next few months should prove this and lead towards release of drawings for tooling, material procurement, construction of toolage and manufacture of parts for assembly, requiring about fifteen months.

"It is impossible to predict an accurate price at this stage but, subject to prevailing labour and material conditions at production time, we would expect the retail price to be between £3,000 and £4,000."

EDITOR'S COMMENTS

That the Massey-Ferguson harvester has made an important contribution to the solution of the problem there can be no doubt. But its future value lies in its ability to harvest the leaning, tangled and recumbent crops —not the straight ones. Straight cane can be harvested satisfactorily by

many of the existing machines, and the recently imported J. & L. Harvester does the job more speedily.

The cutting of cane into short lengths—even though it avoids placing the cane on the ground and then reloading it (perhaps together with some soil and extraneous matter)—involves rather high capital expenditure in fitting all cane trucks with bins; and the maintenance costs on those bins will not be low. But the cutting up of the cane stalks would appear to be the only practicable method of handling lodged and tangled crops. And since no machine has yet been developed which can effectively top such tangled cane it must be accepted—at least for the present—that the tops and adhering leaves will be cut up with the cane and delivered into the bins and ultimately into the mill carrier. The amount of such tops and leaves has, in some of the field trials, been as high as ten per cent. of the total cane weight and this, of course, could not be accepted as "cane" according to the generally accepted meaning of the word.

What, then, is the answer to this problem ? The installation of cleaning equipment at the mill—of the cane laundry type—is an extremely costly matter, and there is the extra cost of disposing of the extraneous material which would be separated by such devices. For every 100 tons of cane delivered there would be upwards of ten tons of rubbish to be carted away and destroyed. And no one has come up with a practicable method of separating the whole cane from the tops and leaves before the cane enters the bin. The miller may conceivably be willing to accept the tops and leaves with the cut up cane if he has not to pay for it and if he is compensated for any extra costs which he may incur by having to crush and treat this non-sugar-containing material. It is obvious also that, if extra extraneous matter is to be conveyed to the mill the number of trucks will have to be increased to maintain the same crushing rate.

There are many problems bound up in the cut-up cane method, but the industry may be justified in adopting the principle as a means of handling more easily the large amount of recumbent cane which exists every year. With the more rapid industrialization of Australia one cannot accept complacently that there will always be an ample supply of cane cutting labour. Mechanization of the harvest may be forced on the industry because of a shrinking labour supply and the many problems associated with cut-up cane may have to be solved by a change in our ideas.

More Droopy Top

By I. T. FRESHWATER.

Many trials have been set out over the years throughout the sugar districts to test soils against possible minor element deficiency. However, in none of these exploratory trials has a response to any minor element application other than copper been noted.

During the past few years with the expansion of the sugar industry on to more marginal types of country, disturbance to the soil by bulldozing and deep ripping, with consequent exposure of a large amount of subsoil. In such cases it appears to be self-correcting with the weathering of the exposed sub-soil, since few affected stools have been noticed in subsequent crops. However, in most areas the symptoms persist and corrective treatment is necessary.

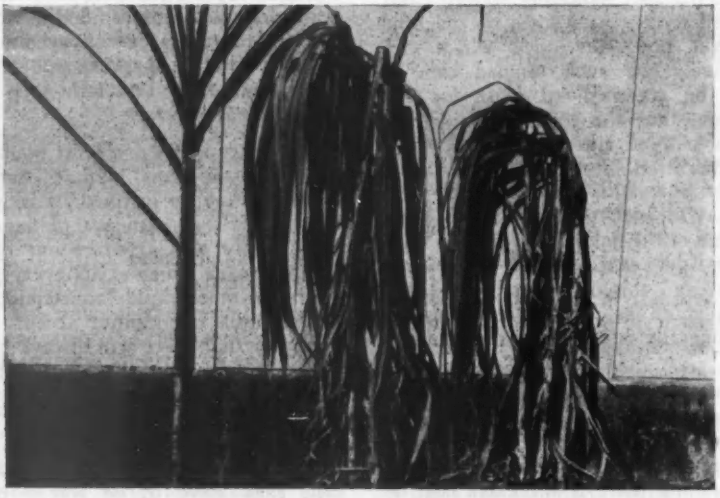

Fig. 61—Typical symptoms of droopy top in cane.

droopy top (copper deficiency) has been recorded in several areas. A shortage of copper causes the top of the cane stalk to become very limp and rubbery, while the leaves droop in a most characteristic manner as the name implies. Other typical copper deficiency symptoms are small dark green islands in the leaves which themselves are pale yellow green in colour.

In the Innisfail area, instances of patchy droopy top have been noticed in the plant cane of the first crop planted on poor, rather low, forest country. This particular condition appears to be brought about by the

Copper sulphate applied to the soil at the rate of 56 lb. per acre is the recommended procedure. This material can be applied separately or it can be mixed and distributed with the fertilizer, thus saving an extra working of the crop. A solution containing copper may also be applied to the plant as a spray, and one of the illustrations shows the recovery of a droopy top-affected crop after a spray application to the foliage. Before the copper was applied, the young stalks were very stunted, and extremely thin and trash bound. After the spray application the complaint disappeared quickly. The cane began to grow

Fig. 62—Healthy cane after application of copper sulphate.

quite vigorously with the stalks developing normal thickness.

Copper sulphate dissolved in water may be applied to the leaf directly as a spray, but this is not normally recommended as severe burning can result. The best procedure is, as mentioned previously, to apply it to the soil. The most expeditious method is to incorporate it with the fertilizer since it is much easier to control the flow of three cwt. or so of mixture through a machine than it is with a bare 56 lb.

It is worth noting that minor element deficiencies have not been located in fields which produce satisfactory crops, despite the fact that these same blocks have grown cane for over fifty years. Nevertheless it is possible that some deficiency may eventually result from such continuous cultivation. Accordingly, any grower who is at all concerned about the probability of a shortage of minor elements in his soil is recommended to consult his local Bureau officer.

Analysis of Soil Samples

During the period in November and December, 1958, when the Bureau was moving to its new headquarters in Brisbane there was an unavoidable delay in the analysis of cane growers' soil samples. All laboratory apparatus and equipment had to be dismantled and packed at the old laboratories and, after removal to the new ones, it took time to unpack and reassemble.

Every effort was made to expedite this changeover, but it was inevitable that delays would occur. During December soils were analysed at a rapid rate and it is hoped that by the end of January the back-lag will have been overcome. We regret any inconvenience caused to cane growers.

The Scott Harvester

By N. McD. SMITH.

Blade harvesters have been described in a previous issue of the *Quarterly Bulletin* and their principle is now well known. The main advantage of being a comparatively low cost unit has been often offset by the lack of topping and bundling devices. It will therefore be of interest to record that Messrs. Scott Bros., Gooburrum, have developed the idea and used a unit with these features during the 1958 season.

Fig. 63—The Scott harvester showing operator at rear regulating the height of topping.

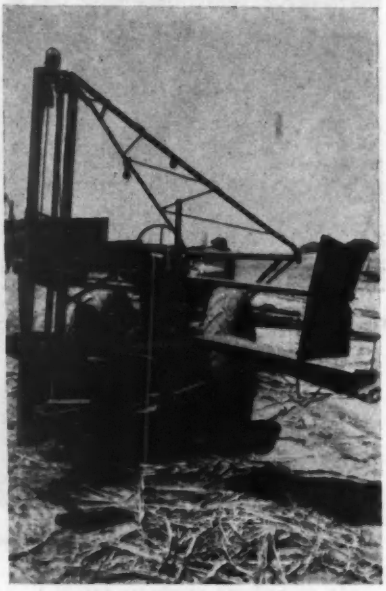

Fig. 64—Details of the topper on the harvester

The machine, as shown in the illustrations, has worked between two farms, cutting over 5,000 tons without a serious breakdown.

In operation the fixed gathering arms draw the stalks upright and the butts are severed by an orthodox shear blade set in front of the tractor. The cut stalks are guided so as to fall across the rows where a hydraulically operated, two-fingered rake situated to the right and front gathers about three to five cwt. before being tripped by the driver.

Meanwhile, an operator seated at the rear of the machine works the mechanism which tops the next row to be cut. The system is that one row is being cut and bundled as the next is being topped.

The topper is driven from the power take-off through a 90 degree box to a sprocket and chain which rotates a vertical steel shaft 8 feet 6 inches long and 1¼ inches square. On the shaft is a running sprocket driving wedge rubber belts which rotate the cutter made of a 22 inch diameter metal disc, plus attached mowing machine blades. The whole cutter

head moves up and down on the square shaft and supporting columns according to the height of the cane. Power to overcome resistance of thrust and friction on the shaft and columns is obtained from a cable and drum, the latter being part of a clutch and brake system driven from the power take-off just prior to entry into the 90 degree box.

About six inches before reaching the cutting disc the tops are gathered by a single series of six inch long fingers attached to a horizontal endless chain moving inwards and set at right angles to the direction of travel. The tops are thus held before severance and move with the chain for almost four feet before being thrown against a large metal stop plate set at about nine feet from the topping point. They then drop to a chute which spills them in a row between the heaps of harvested cane. Power for this phase of the operation is derived from the square drive shaft in a similar manner to the topper except that a chain drive is used.

In an upright crop the machine does a highly satisfactory job as proved by the performance this year.

The Bureau of Sugar Experiment Stations takes this opportunity to extend to all Cane Growers and Millers Our Best Wishes for a Successful and Prosperous Season during 1959.

The Bureau staff look forward to a continuation of the excellent relationships they enjoy with all sections of the industry.

Mackay Varieties in the Far North

By J. H. BUZACOTT

In recent years varieties selected at the Mackay Sugar Experiment Station have shown a great adaptability to conditions in other parts of the State. Q.50 was the first variety to show this characteristic and, in addition to becoming the major variety in the Mackay district, it is now an important variety both in the south and in the far north. More recently Q.58 and Q.63, also Mackay-bred varieties, are showing promise in the far north. Particular features of Q.58 are that it will lodge less easily than Q.50 and, on this account, the variety might replace much of the Q.50 now grown north of Townsville. It is also a very strong ratooner and has a good sugar content—often superior to that of Q.50.

The success of Q.63 is not quite so assured since the rather sparse cover of this variety renders it a somewhat doubtful proposition, at least for the wetter areas of the far north, on account of the weed problem which may develop. However, the very high sugar content of Q.63, both early and late in the season, makes it worthy of a thorough trial. It is a curious fact that a variety with such high early sugar as Q.63 should have been developed from two varieties, Trojan and C.P.29/116, both of which have a low sugar content early in the season.

The great success of Mackay-bred varieties in the far north seems to be due to the fact that for Mackay use the varieties must successfully resist both water logging and drought. Since the drier soil types of the far north are virtually water-logged in the wet season but suffer from drought during the latter half of the year, varieties selected at Mackay seem destined to find an important place there.

Fig. 65—Young plant cane of Q.63 (left) and Q.58 (right) in the Cairns district.

The accompanying picture shows young plant cane of Q.63 on the left and Q.58 on the right growing on a dry red schist soil in the Cairns district. The erect narrow-leaved foliage and consequent lack of cover of Q.63 is evident in the picture.

FREE SERVICES TO CANE GROWERS

The Bureau offers the following free services to *all* cane growers in Queensland:—

Soil Analysis and Fertilizer Recommendations

Your soil will be analysed by the most modern methods, and a report will be posted containing a recommendation covering the type of fertilizer required, the amount per acre, the need for lime, and other relevant information. Phone the nearest Bureau office and the soil samples will be taken as soon as possible.

Culture of Green Manure Seed

Cultures and instructions for the inoculation of the seed of cowpeas, velvet beans, mung beans or any other legume will be posted to any cane grower upon request to The Director, Bureau of Sugar Experiment Stations, Brisbane. Allow a week after receipt of your letter for the culture to be prepared and posted, but as the culture will easily keep a month or so it is a good idea to get your culture when you get your seed. If sowing is delayed, ask for another batch of culture; there is no charge.

Advice on All Phases of Cane Growing

The Bureau staff is at the service of all cane growers. They can best advise you on matters pertaining to varieties, fertilizers, diseases, pests, drainage and cultural methods. Bureau officers are available in every major cane growing district. A phone call will ensure a visit to your farm.